

STATE OF IDAHO
FISH AND GAME DEPARTMENT

John R. Woodworth, Director

ANNUAL REPORT

BIOLOGICAL & ECONOMIC SURVEY OF FISHERY RESOURCES IN LAKE PEND OREILLE
THE LAKE PEND OREILLE CREEL CENSUS AND LIFE HISTORY STUDIES, 1968

By

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THE LAKE PEND OREILLE CREEL CENSUS AND LIFE HISTORY STUDIES, 1968

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THE LAKE PEND OREILLE CREEL CENSUS AND LIFE
HISTORY STUDIES, 1968

ABSTRACT

The 1968 creel census at Lake Pend Oreille was designed to determine the size and quality of the annual fish harvest and establish the catch by resident, nonresident, and commercial fishermen. The stratified sample was 9 percent of the estimated number of fishermen using the lake.

Creel census estimates for 1968 show that 54,183 anglers spent 241,755 hours to catch 600,865 fish. Approximately 78.3 percent of the fishermen were seeking kokanee, which made up 98.6 percent of the catch. About 21.3 percent sought trout, which comprised 0.9 percent of the catch, and 0.4 were after other species (perch, crappie, etc.) which comprised 0.3 percent of the catch.

Resident sport fishermen comprised 31.9 percent of the total fishermen, caught 34.7 percent of the total catch, and made 34.5 percent of the kokanee landings. Nonresident sport fishermen made up 65.5 percent of the total anglers, harvested 48.6 percent of the total catch, and took 48.6 percent of the kokanee catch. Commercial fishermen comprised 2.6 percent of the total anglers, harvested 16.7 percent of the total catch, and 16.9 percent of the kokanee catch.

Kokanee fishermen averaged 2.9 fish per hour, trout fishermen averaged 12.5 hours per trout, and Kamloops fishermen 25 hours per Kamloops.

Resident sport fishermen averaged 2.5, nonresidents 1.9, and commercial fishermen 11.5 fish per hour of effort.

Kokanee life history studies by the length-frequency and scale methods indicate: 80.9 percent, weighing 55.8 tons was from the 1963 year class; 18.3 percent, weighing 8.8 tons from the 1964 year class; and 0.8 percent, weighing 0.2 tons, from the 1965 year class.

The 1964 year class appears to be quite weak and should contribute below average numbers to the 1969 fishing. Kokanee fishing in 1969 should be below average.

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RECOMMENDATIONS

It is recommended that the creel census program be continued on Lake Pend Oreille annually to gather information that can be utilized in management of this fishery.

It is recommended that the program to mark all Kamloops planted in Lake Pend Oreille (with the exception of fry) be continued to evaluate the relative contributions of hatchery and wild fish to the catch.

OBJECTIVES

A creel census has been conducted on Lake Pend Oreille since 1951 by the Idaho Fish and Game Department. Objectives of this 18-year census are:

- (1) to determine the size and quality of the catch of fish coincident with the construction and operation of Cabinet Gorge Dam on the major tributary and Albeni Falls Dam on the outlet; and
- (2) to gather information to be used in management of the fishery.

TECHNIQUES USED

The creel census plan was similar to that used during the previous year. This plan called for a stratified sample to be taken from each of the seven census periods which extended through the fishing year (January 13 - November 30).

A total of 4,831 fishermen (approximately 9 percent of the total estimated number) were interviewed for creel data during the year. Approximately 99.4 percent of the fishermen leaving the lake through census areas on census days were contacted by a census clerk.

FINDINGS

Total Effort and Catch

Creel census estimates indicate that 54,183 anglers spent 241,755 hours to catch 600,865 fish from Pend Oreille Lake. The catch included 593,704 kokanee, 4,162 rainbow, 782 cutthroat, 624 Dolly Varden, 49 mountain whitefish, 104 lake whitefish, 739 perch, 407 crappie, 228 largemouth bass, and 66 other game fish (Table I).

The commercial season extended from January through May. During this period commercial anglers caught an estimated 100,278 kokanee.

Approximately 78.3 percent of the fishermen were seeking kokanee which made up 98.6 percent of the catch. About 21.3 percent sought trout which comprised 0.9 percent of the catch, and 0.4 were after other species (perch, crappie, etc.) which comprised 0.3 percent of the catch.

Resident Sport Catch

Resident sport fishermen comprised 31.9 percent (17,260) of the total fishermen, caught 34.7 percent (208,519) of the catch, and made 34.5 percent (204,972) of the total kokanee landings (Table 2).

Nonresident Sport Catch

Nonresident sport anglers made up 65.5 percent (35,492) of the total anglers, harvested 48.6 percent (292,062) of the total catch, and took 48.6 percent (288,454) of the kokanee catch (Table 3).

Commercial Catch

Commercial fishermen comprised 2.6 percent (1,431) of the total anglers, harvested 16.7 percent (100,284) of the total catch, and 16.9 percent (100,278) of the kokanee catch (Table 4).

Rates of Catch of Kokanee and Trout Fishermen

All fishermen combined averaged 2.5 fish per hour during the 1968 fishing season. Resident fishermen averaged 2.5, nonresidents 1.9, and commercial fishermen 11.5 fish per hour of effort.

An estimated 42,425 fishermen sought kokanee in 1968. Fishermen who fished specifically for kokanee averaged 2.9 kokanee per hour (Table 5). Commercial fishermen expended 3.6 percent of the effort in 1968 and averaged 11.5 kokanee per hour.

A total of 11,541 anglers sought trout in 1968. Trout fishermen averaged 12.5 hours per trout in 1968 while it required 25 hours to land a Kamloop (Tables 6 and 7).

Table 1. Total estimated utilization by all fishermen and their catch,
Lake Pend Oreille, Idaho, 1968.

Period	Men	Hours	Kokanee	Cut-throat	Dolly Varden	Rain-bow	Mtn. white-fish	Lake white-fish	Perch	Crappie	Large-mouth bass	Other game fish	Non-game fish
Jan. 13 - Feb. 27	2,968	13,226	110,898	---closed season---			--	--	--	--	--	--	--
Feb. 28 - Apr. 14	1,071	4,757	4,968	---closed season---			--	--	--	--	36	--	--
Apr. 15 - May 30	6,260	30,828	90,272	72	202	724	--	36	210	105	126	--	--
May 31 - July 15	16,084	70,152	136,559	292	225	1,694	--	--	250	--	--	36	--
July 16 - Aug. 30	14,802	60,894	114,754	124	40	792	42	68	265	104	66	30	--
Aug. 31 - Oct. 15	11,614	56,198	136,235	78	28	666	7	--	14	--	--	--	--
Oct. 16 - Nov. 30	1,384	5,700	18	216	129	286	--	--	--	198	--	--	--
Totals	54,183	241,755	593,704	782	624	4,162	49	104	739	407	228	66	--

Table 2. Total estimated utilization by resident sport fishermen and their catch, Lake Pend Oreille, Idaho, 1968.

Period	Men	Hours	Kokanee	Cut-throat	Dolly Varden	Rain-bow	Mtn. white-fish	Lake white-fish	Perch	Crappie	Large-mouth bass	Other game fish	Non-game fish
Jan. 13 - Feb. 27	2,330	9844	66,421	---closed season---			--	--	--	--	--	--	--
Feb. 28 - Apr. 14	459	2,045	795	---closed season---			--	--	--	--	--	--	--
Apr. 15 - May 30	2,712	13,644	22,520	72	138	518	--	30	--	--	36	--	--
May 31 - July 15	4,133	21,462	43,978	70	81	741	--	--	210	105	126	--	--
July 16 - Aug. 30	3,066	11,826	24,708	30	--	176	--	--	12	--	--	36	--
Aug. 31 - Oct. 15	3,817	21,293	46,550	39	--	440	--	--	7	--	--	--	--
Oct. 16 - Nov. 30	743	2,841	--	216	66	200	--	--	--	198	--	--	--
Totals	17,260	82,955	204,972	427	285	2,075	--	30	229	303	162	3	--

Table 3. Total estimated utilization by non-resident sport fishermen and their catch, Lake Pend Oreille, Idaho, 1968.

Period	Men	Hours	Kokanee	Cut-throat	Dolly Varden	Rain-bow	Mtn. white-fish	Lake white-fish	Perch	Crappie	Large-mouth bass	Other game fish	Non-game fish
Jan. 13 - Feb. 27	182	770	4,214	---closed season---			--	--	--	--	--	--	--
Feb. 28 - Apr. 14	371	1,379	686	---closed season---			--	--	--	--	--	--	--
Apr. 15 - May 30	2,814	12,436	11,224	--	64	206	--	--	--	--	--	--	--
May 31 - July 15	11,951	48,690	92,581	222	144	953	--	--	238	--	--	--	--
July 16 - Aug. 30	11,736	49,068	90,046	94	40	616	42	68	258	104	66	30	--
Aug. 31 - Oct. 15	7,797	34,905	89,685	39	28	226	7	--	14	--	--	--	--
Oct. 16 - Nov. 30	641	2,859	18	--	63	86	--	--	--	--	--	--	--
Totals	35,492	150,107	288,454	355	339	2,087	49	68	510	104	66	30	--

Table 4. Total estimated utilization by commercial fishermen and their catch, Lake Pend Oreille, Idaho, 1968.

Period	Men	Hours	Kokanee	Lake whitefish
Jan. 13 - Feb. 27	456	2,612	40,263	-
Feb. 28 - Apr. 14	241	1,333	3,487	-
Apr. 15 - May 30	734	4,748	56,528	6
Totals	1,431	8,693	100,278	6

Table 5. Catch data for interviewed anglers (including commercial) seeking kokanee, Lake Pend Oreille, Idaho, 1968.

Month	Men	Hours	Kokanee	Other game fish	Kokanee per hour	All game fish per hour
January	12	55	731	0	13.3	13.3
February	254	1,123	7,203	0	6.4	6.4
March	47	175	21	0	0.1	0.1
April	80	383	1,398	6	3.7	3.7
May	407	1,820	7,138	57	3.9	4.0
June	780	3,023	8,417	67	2.8	2.8
July	593	2,240	3,815	24	1.7	1.7
August	831	3,551	8,379	49	2.4	2.4
September	698	3,677	10,023	24	2.7	2.7
October	78	338	802	0	2.4	2.4
November	0	0	0	0	0.0	0.0
Totals	3,780	16,385	47,927	227		
Average (weighted)					2.9	2.9

Table 6. Catch data for interviewed anglers seeking trout, all species combined, Lake Pend Oreille, Idaho, 1968.

Month	Men	Hours	Trout	Other game fish	Trout per hour	All game fish per hour
May	329	1,568	100	4	0.06	0.07
June	248	937	106	16	0.11	0.13
July	123	523	24	9	0.04	0.06
August	67	302	21	12	0.07	0.11
September	78	71	22	0	0.31	0.31
October	63	233	8	0	0.03	0.03
November	116	510	37	0	0.07	0.07
Totals	1,024	4,144	318	41		
Average (weighted)					0.08	0.09

Table 7. Catch data for interviewed anglers seeking Kamloops rainbow trout, Lake Pend Oreille, Idaho, 1968.

Month	Men	Hours	Kamloops rainbow	Other trout	Other game fish	Kamloops rainbow per hour	Kamloops & other trout per hour	All game fish per hour
May	280	1,376	56	16	3	0.04	0.05	0.05
June	186	648	31	17	9	0.05	0.07	0.09
July	98	453	9	1	7	0.02	0.02	0.04
August	61	281	14	2	5	0.05	0.06	0.07
September	75	49	19	1	0	0.39	0.41	0.41
October	63	233	3	5	0	0.01	0.03	0.03
November	109	484	20	6	0	0.04	0.05	0.05
Totals	872	3,524	152	48	24			
Average (weighted)						0.04	0.06	0.06

Average time fished was 4.8 hours for residents, 4.2 hours for nonresidents, and 6.1 hours for commercial fishermen.

Kokanee Harvest by Year Class

In order to determine the age and growth characteristics of kokanee in the 1968 fishery, 1,243 fish were measured at periodic intervals throughout the year (Table 8). When these lengths are plotted, the distribution generally indicates the size range for each age class and their relative contribution to the fishery. Age analysis by scale reading is used to verify the length-frequency indications. No spawning fish were measured during the year because spawning runs were below average and no fish were handled in Granite Creek.

The 1968 harvest was predominantly from the 1963 year class (progeny of egg deposited in November and December, 1963) with about 80.9 percent of the catch coming from that year class. The 1964 year class made up 18.3 percent of the harvest and the 1965 year class 0.8 percent.

The 1963 year class made up 86.1 percent (55.8 tons); the 1964 year class 13.6 percent (8.8 tons); and the 1965 year class 0.3 percent (0.2 tons) of the total poundage (Table 9).

The age composition information from the 1968 catch Indicates the relative strength of the year classes that will provide the fishable population during 1969. Information available since 1956 indicates that approximately 75 percent of any given age class will be taken during its fifth year in the lake (Table 10). Applying this average figure to the 1968 data would indicate that the 1964 year class is quite weak and that kokanee fishing should be considerably below normal during the 1969 season.

Trout

All trout that were observed during the creel census work were measured. These measurements presented a representative sample of the size of trout caught from Pend Oreille Lake. Cutthroat trout lengths ranged from 6 to 18 inches

Table 8.Length-frequency distribution of 1,243 kokanee from the catch of Lake Pend Oreille, Idaho, 1968.

Length group (mm)	1968 Creel Census						
	1/13-2/27	2 28-4/14	4/15-5/30	5/31-7/15	7/16-8/30	8/31-10/15	10/16-11/30
150-4	1	--	--	--	--	--	--
155-9	1	--	--	--	--	--	--
165-9	--	--	--	--	--	--	--
170-4	2	--	1	--	--	--	--
175-9	--	--	2	--	--	--	--
180-4	1	1	3	--	1	--	--
185-9	3	2	2	--	--	--	--
190-4	14	5	5	--	--	--	--
195-9	15	10	5	1	4	--	--
200-4	25	5	3	6	1	--	--
205-9	18	5	16	10	2	4	--
210-4	23	8	15	8	3	8	--
215-9	35	13	19	10	5	20	1
220-4	36	25	37	15	5	10	1
225-9	33	14	57	36	2	5	--
230-4	25	8	64	38	8	10	--
235-9	12	4	46	35	24	26	1
240-4	2	--	23	19	50	50	2
245-9	--	--	7	7	40	28	1
250-4	--	--	2	1	27	16	2
255-9	--	--	--	1	15	10	--
260-4	--	--	--	--	6	8	--
265-9	--	--	--	--	2	4	--
270-4	--	--	--	--	--	1	--

Table 9. Estimated total catch of kokanee by year classes, Lake Pend Oreille, Idaho, 1968.

Period	Estimated number of kokanee caught	1963			1964			1965		
		Percent	Number	Pounds	Percent	Number	Pounds	Percent	Number	Pounds
Jan. 13 - Feb. 27	110,898	67.5	74,857	17,217	30.9	34,267	5,140	1.6	1,744	124
Feb. 28 - Apr. 14	4,968	75.0	3,726	745	25.0	1,242	174	0.0	--	--
Apr. 15 - May 30	90,272	84.4	76,190	16,000	13.0	11,735	1,760	2.6	2,347	258
May 31 - July 15	136,559	85.6	116,895	24,548	14.4	19,664	3,143	0.0	--	--
July 16 - Aug. 30	114,754	89.2	102,360	26,614	10.3	11,820	2,009	0.5	574	63
Aug. 31 - Oct. 15	136,235	78.0	106,263	26,566	22.0	-29,972	5,395	0.0	--	--
Oct. 16 - Nov. 30	18	75.0	14	4	25.0	4	1	0.0	--	--
Total number	593,704		480,305			108,704			4,695	
Total pounds				111,699			17,622			445
Percent of total number (weighted)		80.9			18.3			0.8		

Table 10. Harvest of kokanee from Pend Oreille Lake by year classes.

Year	Catch	Distribution of the catch by year classes												
		1953	1954	1955	1956	1957	1958	1959	1960	1961	1962	1963	1964	1965
1956	1,092,651	87,400												
1957	751,113	199,700	61,200											
1958	1,197,076	742,600	401,700	51,700										
1959	1,261,943	6,500	1,051,600	181,700	22,100									
1960	1,038,000		700	819,700	210,500	7,300								
1961	992,559			2,400	809,400	113,500	67,200							
1962	650,960				2,661	414,217	218,977	15,105						
1963	1,049,339					-	796,282	191,779	61,278					
1964	1,148,197						361	697,690	387,323	62,823				
1965	1,003,132							862	751,501	238,173	12,596			
1966	807,169								291	709,331	85,646	11,901		
1967	898,748									501	631,431	222,544	44,282	
1968	593,704										-	480,305	108,704	4,695
Totals		1,036,200	1,515,200	1,055,500	1,044,661	535,017	1082,820	905,436	1,200,393	1,010,828	729,673	(inc.)	(inc.)	(inc.)

and averaged 12.4 inches. Dolly Varden ranged from 12 to 29 inches, averaging 18.7 inches while Kamloops varied from 7 to 39.5 inches in the creel and averaged 14.6 inches.

Approximately 11,548 anglers sought trout in 1968. An average of 12.5 hours was required to boat a trout during the year. The number of Kamloops caught during 1968 was 4,162 with 20.0 percent (832) of these Kamloops being trophy-size fish. The catch rate for Kamloops during 1968 was 25 hours per fish. Kamloops fishing during 1968 was up from the previous year and could be classed as an average season.

The catch of Dolly Varden in 1968 was the lowest on record, 624. This eclipsed the 1967 low of 657 and continues a downward trend in spite of measures aimed at reversing this trend.

The cutthroat catch for 1968 was extremely bellow average for the second straight year and set a new all time low at 782.

Lamprey

Only one lamprey -- Lampetra fluviatilis (Linnaeus) -- was reported taken from Pend Oreille Lake during 1968. This specimen was attached to a kokanee caught in late August from the south end of the lake.

Water Level Fluctuation

In recent years the Corps of Engineers has fluctuated the water level of Pend Oreille lake considerably. Major concern has been for fluctuations subsequent to kokanee spawning, thus dewatering eggs and causing resultant mortalities.

During 1968 kokanee were actively spawning at Bayview by November 19, at lake elevation 2058.2. The lake was drafted to 2056 by December 1, and stabilized at that point for the entire winter. This two foot drawdown subsequent to kokanee spawning will cause some losses but these probably will not be of a large magnitude. Fortunately, the majority of the drawdown occurred prior to kokanee spawning activity during 1968.

A weak 1963 year class caused poor kokanee fishing during 1968 and a 1964 year class that appears to be even weaker should cause even poorer kokanee fishing during 1969. Each of these year classes may be traced back to a significant lake drawdown during their incubation period. Although many factors may contribute to weak age classes, the available Information indicates that significant drawdowns do significantly weaken a given year class. Available records indicate five significant drawdowns of Pend Oreille Lake after kokanee began spawning. The fishing that resulted from these affected year classes was considerably below average for four of the five years. The one instance in which a significant drawdown was not followed by poor fishing may have been the result of going into the spawning season with what appeared to be the largest kokanee population that has been recorded. At least the catch for that year (1,232,916 in 1954) was the largest catch ever recorded from Pend Oreille Lake.

The Corps of Engineers persists on regarding December 1, as the target date for termination of drawdowns on Pend Oreille Lake. This is in spite of knowledge that kokanee normally appear on the spawning grounds and start to spawn on approximately November 15, and most fish are actively spawning by November 20.

It is felt that the evidence is strong enough to expect a significant draw-down after November 15, to significantly weaken a given year class.

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